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RASPBERRY CULTURE IN MAINE

MAINE DEPARTMENT OF AGRICULTURE

AUGUSTA

Raspberry Growing in Maine

BY
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Raspberry Culture in Maine

THE industry of raspberry growing is one which can be expanded to a considerable degree in the State of Maine, and will increase the income on many farms. Raspberries can be profitably grown in conjunction with dairying, poultry raising, apple growing, and vegetable gardening, without seriously interfering with these enterprises.

TYPES OF RASPBERRIES

There are three types of raspberries that are grown in nearly all cane-fruit growing sections. These types are the black raspberry, the purple raspberry, and the red raspberry.

Black Raspberries

The black raspberries are poorer sellers than the reds, due to their inferiority as to color and attractiveness. They also are not as hardy as the red varieties. Under Maine conditions it does not seem best to attempt the growing of black raspberries.

Purple Raspberries

The purple raspberry is a hybrid between the black and red types. It bears a good crop, but is not inclined to be as hardy as the red raspberry. Here again, the dull color of the berries inhibits their sale, especially if they are in direct competition with the more attractive red sorts. The quality of this type is good, and they deserve a place in many a home garden. The best variety is the Columbian. In fact, there has not been any other purple variety which approaches it for hardiness, vigor, or quality.

Red Raspberries

The red raspberries in general, are hardier than the other two types and sell more readily. Under Maine conditions, they can be grown with very little risk, if the proper varieties are selected.

From our present knowledge, there are really only three varieties of red raspberries that we can safely recommend under our conditions. They are the Latham, the Herbert, and the Cuthbert, named in the order of their resistance to cold temperatures.

The Latham variety is comparatively new in its origin and has met with outstanding success in nearly all sections of the country. The plants are unusually vigorous and productive, producing strong, robust canes which are nearly thornless, and of a reddish color. The fruit is large, and of a bright attractive red color. One of its greatest attributes is that it does not succumb readily to the effects of mosaic. In many comparative tests it has out-yielded the Cuthbert variety.

The Herbert is a good commercial berry, of high color and good vigor. Under Maine conditions it does not prove as hardy as the Latham variety, but is hardier than the Cuthbert. It is considered to surpass the Latham variety as to flavor.

The Cuthbert variety is outstanding for the high quality of its fruit, but under average Maine conditions it cannot be depended upon to live through the winter without protection of some sort. Winter protection is expensive and not altogether satisfactory, and when we can grow Lathams without this extra cost, why not do it? There are certain particularly well protected sites where the Cuthbert can be successfully grown, and in such cases, it receives the highest recommendation. The determination of such a situation can only be had by trial.

Everbearing raspberries have no place in the commercial plantation, but if a rather continuous supply is desired for home use, their setting is justified. St. Regis is probably the only practical variety for Maine.

There are a few new varieties of red raspberries being tried out at present but to date they have not been sufficiently proven to warrant their planting extensively.

SELECTING THE SITE

Soil

The red raspberry is not extremely particular as to soil requirements. A sandy loam is probably preferred, but they are successfully grown on fairly heavy soils.

The moisture supply of the soil is the most important consideration. By all means the water table should be at least three feet below the surface during the growing season, and yet the soil should contain sufficient moisture in order that it will not be excessively dry during the production period. The best insurance of the latter quality is to have a soil that is high in humus content. Humus is a great water holder, and at the same time tends to make heavy soils more friable.

Atmospheric Drainage

One of the essentials of a suitable site is that it have good air drainage. Cold air being heavier than warm air, we find the lowest temperatures at the lowest elevations. It is therefore best to locate our raspberry plantation on the side of a hill where the cold air will fall below, and yet in a position where it is protected from the prevailing winds.

Exposure

This leads us up to the third consideration in choosing the site of a raspberry plot.

In the majority of situations probably a north to northeast exposure is best, as there is less freezing and thawing of the soil in the spring, and less drying out of the soil in the summer.

There is another consideration in choosing the exposure. It is the matter of the prevailing winds. If at all feasible, the plantation should be protected from these winds by either locating them on a slope which undulates away from them, or by protecting them with a windbreak of pines or some tree growth.

SELECTION OF NURSERY STOCK

The selection of vigorous, hardy, and healthy nursery stock is one of the essentials to success. Many states now require that their nurseries have two inspections during the growing season, and if after these inspections they are found practically free from all virus diseases except mild mosaic, they are certified, and can advertise as producers of mosaic-free stock. It is always advisable to purchase all stock from such nurseries.

Here in the State of Maine we have not, to date, required more than one inspection each year. In the future we will probably come to the method employed by other states.

If persons desiring to buy raspberry nursery stock will write to the Maine Department of Agriculture at Augusta, Maine, they can obtain the names of recommended growers within the State of Maine who produce healthy raspberry stock. It is really not safe to secure your plants from "any old grower," due to the general prevalence of mosaic and other raspberry troubles.

After a grower once gets his plantation established, he can propagate his own stock. Red raspberries produce suckers which grow up from the roots. In the spring they can be dug up and reset in a new location. If many plants are dug up, it is usually best to have a separate propagating bed so as not to disturb the fruiting plantation.

Black raspberries and purple canes are propagated by tip layering. The process simply consists of covering the tip ends of canes in late summer. By the following spring, the tips will have rooted sufficiently to form strong new plants. The cane is severed so as to leave 6 or 8 inches with the new plant, and then it is ready for setting in the new location.

PREPARATION OF THE SOIL

In order to obtain the best results, two years ought to be used in preparing the ground for the setting of the plants. In the first place an abundant supply of humus is quite essential. If the land can be heavily dressed with barnyard manure, and then some rank growing crop sown, and this plowed under, considerable organic matter will be incorporated in the soil. The following year some hoed crop should be grown, and the ground kept free from all weeds. The ground should be plowed as deeply as possible that fall, and then the following spring the plantation should be thoroughly disked. Deep and thorough cultivation is essential in a raspberry plantation to insure a continuous supply of moisture over a period of years.

SYSTEM OF PLANTING

There are two systems which can be employed in setting out the raspberry plantation. They are the narrow hedge system and the hill system.

Narrow Hedge System

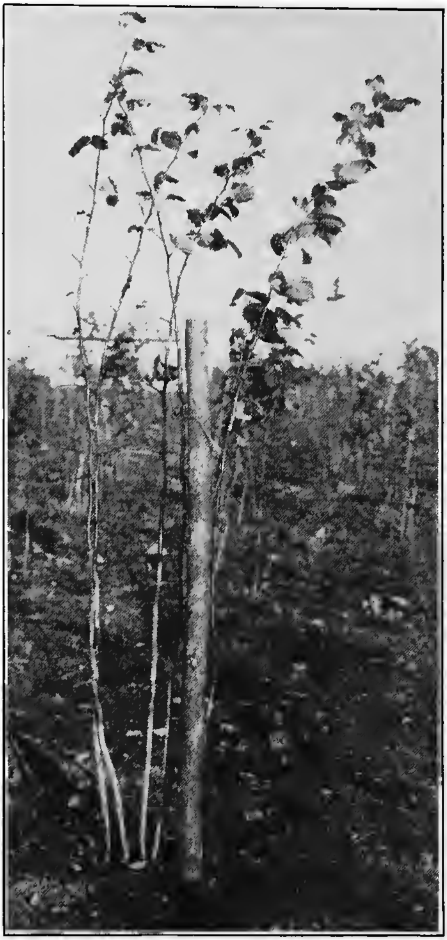
The narrow hedge system consists of setting the plants in rows, 7 or 8 feet apart, and about 2½ feet apart in the row. The rows are not allowed to spread out so that they are over 12 inches wide.

Hill System

The hill system consists of setting the plants out so that they can be cultivated both ways. Some growers practice setting them 5 feet apart each way, but it is quite common to set them 8 feet apart one way and 4 feet the other. The latter practice is to be recommended when plenty of land is available.

Larger yields can be obtained from the narrow hedge system, if the plantation is kept free from weeds and grass. But, it is a very easy thing to allow witch grass to creep in, and before the grower realizes it, his plantation is all choked out. A great deal of hand work is necessary in order to keep a plantation of this sort in good condition, and therefore the labor costs are considerably increased.

The hill system permits the practice of horse cultivation in both directions and very little hand work is necessary. Although a somewhat lower yield per acre is had, it is more than made up by the lower production costs. Under Maine conditions, it seems best to use the hill system for commercial plantations.



Hill of Latham Raspberry Plants Staked up for the Winter

Note that about six canes are left, and that no heading back has been done.

MARKING THE FIELD

After the ground is fully prepared, the field should be marked off in accordance with the system to be followed.

There are several methods of marking off a field. One, which can be used by any person, is to set stakes at each end of the field the same distance apart as the rows are to be, and then run a wheel-barrow between them. The mark made by the wheel will be sufficient to tell where the plants should go. If the hill system is employed, stakes should be set 8 feet apart on two opposite sides and 4 feet apart on the other sides, and then the barrow row between them. The plants should then be set at the intersection of the wheelbarrow tracks.

A hand marker can be easily made by any man, by attaching three pieces of two-by-fours about 18 inches long, as teeth, to a cross piece, and attaching a tongue, to draw it by. The teeth can be set 4 feet apart and made removable so that they can be used for either 4 or 8 foot rows.

SETTING THE PLANTS

After the rows are marked off, the plants should be set. They should be set as early in the spring as the condition of the ground will permit, so that they will become well established before the dry conditions of summer weather arrive.

The most efficient crew for setting the plants would consist of three men. One man goes ahead and distributes the plants ahead of the setters. He should be careful not to keep too far ahead, because the roots of the plants will be exposed to the sun, and thus dry out. The plants should be placed in buckets of water over the field ahead of time, thereby keeping them wet until just before planting. The other two men comprise the setting crew. One inserts a spade into the ground and pushes it forward, the other places the plant just back of the spade. The spade is then again inserted just back of the plant, in order to compact the soil around the roots. The ground is then firmed again by pressing it with the feet, and the act is finished.

After the plants are set, it is best to cut them off within a few inches of the surface of the ground. Some growers attempt to produce a crop the first year, but it is absolutely impossible to do it without injuring the growth of the canes, and thereby reducing the crop for the following year. It is much better to wait a time with patience, and then reap double reward the following year.

FERTILIZATION

In the matter of fertilization, we find a great variance as to policies. Some growers use wholly barnyard manure; others use a combination of barnyard manure and commercial fertilizer; still others use commercial fertilizers alone.

Barnyard manure is very good for supplying the necessary elements and at the same time adding humus to the soil. If plenty of manure is available, it should be used. It is probably best to apply a little nitrate of soda in the spring to start growth, but one must be careful not to apply too much, as the result will be an excess of cane growth at the expense of fruit formation.

If manure is unavailable, a 5-8-7 commercial fertilizer should be applied, at the rate of about 800 pounds to the acre. This should be applied each spring, as soon as growth starts. One advantage of a commercial fertilizer is that growth can be controlled easier by its use than with manure, due to its quicker action.

The humus supply should be maintained by sowing a cover crop such as oats or buckwheat in the late summer. It can be plowed under, either late that fall or the following spring. This cover crop also tends to stop growth in the fall and thus reduces the tendency toward winter-killing.

CULTURAL PRACTICES

As was stated before, if a cover crop is sown, it should be plowed under either in the fall or in the spring. If plowed under in the fall, more plant food is returned to the soil, but if allowed to remain until spring, a certain amount of protection will be afforded during the winter. The furrow next to the rows, should be plowed toward the plants one year, and away from them the following year, so as to keep the ground more even.

After plowing in the spring the ground should be thoroughly gone over with a horse cultivator, and the necessary amount of hand work should be done in order to rid the plantation of all grass and weeds. After the first cultivation, the plants should be thoroughly gone over with a cultivator as often as needed, the frequency depending upon the amount of rainfall. The ground should never be allowed to become hard, due to lack of cultivation. The maintenance of a dust mulch has been advocated in the past, but its value as a moisture preserver is now disputed.

One should be careful in cultivation not to stir the soil too deeply, as many roots will be broken which are very useful in obtaining plant food for the bushes. This breaking of the roots also predisposes toward the production of numerous suckers.

INTERCROPS

It is possible, and not a practice to be discouraged, to grow some crop between the rows during the first one or two years of growth.

One should be careful to select such crops that will not interfere with the development of the raspberry plants. Such crops as cabbage, beets, carrots, etc., which do not require much space, are appropriate for such use.

PRUNING

Pruning the Red Raspberry

The red raspberry bears its fruit on young shoots which arise from buds on the previous years growth. Each cane dies after its second year of growth so all two-year canes can be removed after fruiting, without affecting the following year's production.

Besides removing old canes there are two other pruning operations which must be practiced in order to give the plants proper care. These operations are thinning out and cutting back. Before one can intelligently prune, it is well to have an understanding of the bearing habits of the plant.

Johnston and Loree of Michigan carried on an experiment with Cuthbert raspberries in an attempt to determine the bearing habits of the red raspberry, in order that the grower could govern his pruning in accordance with such habits. Following are some of the conclusions that they arrived at: About 62 per cent of all buds produce shoots which mature their fruits; about 10 per cent remain dormant; 12 per cent develop into non-productive vegetative shoots; 10 per cent winter-kill and small percentages are either injured by wind, or mechanically during cultivation. They found that the five basal buds are relatively unfruitful. The second five-bud section is usually most productive. Beyond the 10th bud, each five-bud section is progressively less productive. The largest berries originate from those shoots near the base of the cane, gradually decreasing in size as they approach the tip. Larger yields are obtained from canes of the greatest diameter. The naturally branched canes prove to yield more berries, and be more profitable than unbranched canes. This shows the necessity of selecting the more vigorous canes, and cutting out the weaker ones. The 10th to 15th buds on the laterals prove to be the most productive. Beyond the 15th bud, both the size and number of berries decrease rapidly. Pinching off the young shoots in summer seems to result in the production of vegetative shoots that are very susceptible to winter injury. They found that, as a rule, the thinning out of canes generally reduces the yield without materially increasing the size of the berry. But, also it was shown that there is a limit to the number of canes that should be retained. Light heading back seems to increase the yield somewhat, while heavy cutting back reduces the yield materially without any appreciable increase in size of fruit.

From these principles we can readily see that raspberries should not be headed back severely, if the greatest yields are to be expected.

It is probably safe to say that the maximum number of canes which should be retained per plant, when grown in accordance with the hill system, is about eight, and when grown in hedgerows, about ten to four feet of row.

The grower should select strong, branched canes, and should cut out the inferior, weak ones. It is absolutely necessary to carry on such cultural practices that will produce vigorous plants, if large yields are to be obtained.

Whether the pruning should be done in the fall or in the spring, seems to be a question of dispute among authorities. If the old canes are removed immediately after bearing, there is less danger of transmitting diseases to the young shoots. But if they are allowed to remain, they serve as a partial support and protection during the winter. Probably the best method is to cut out all old canes as soon as the fruit is harvested. Then the canes and branches can be headed back, and the weak canes removed the following spring. It is much better to head back in the spring, as some of the canes may be killed back during the winter.

Cutting back the canes and tips of branches makes them stockier, thus causing them to withstand strong winds. It also makes the picking of the fruit much easier. This process of cutting back is one which demands a certain amount of judgment on the part of the grower. The amount of heading back depends upon the moisture content of the soil. The least amount of heading that will produce berries of good size, and yet keep the fruit off the ground, is usually best.

Pruning the Black and Purple Raspberries

The pruning of the black and purple varieties is just the same as for the red ones, except that the cutting back should be much more severe. This cutting back is usually done by pinching the tip during the growing season when the plants have reached the desired height. This causes the formation of strong laterals.

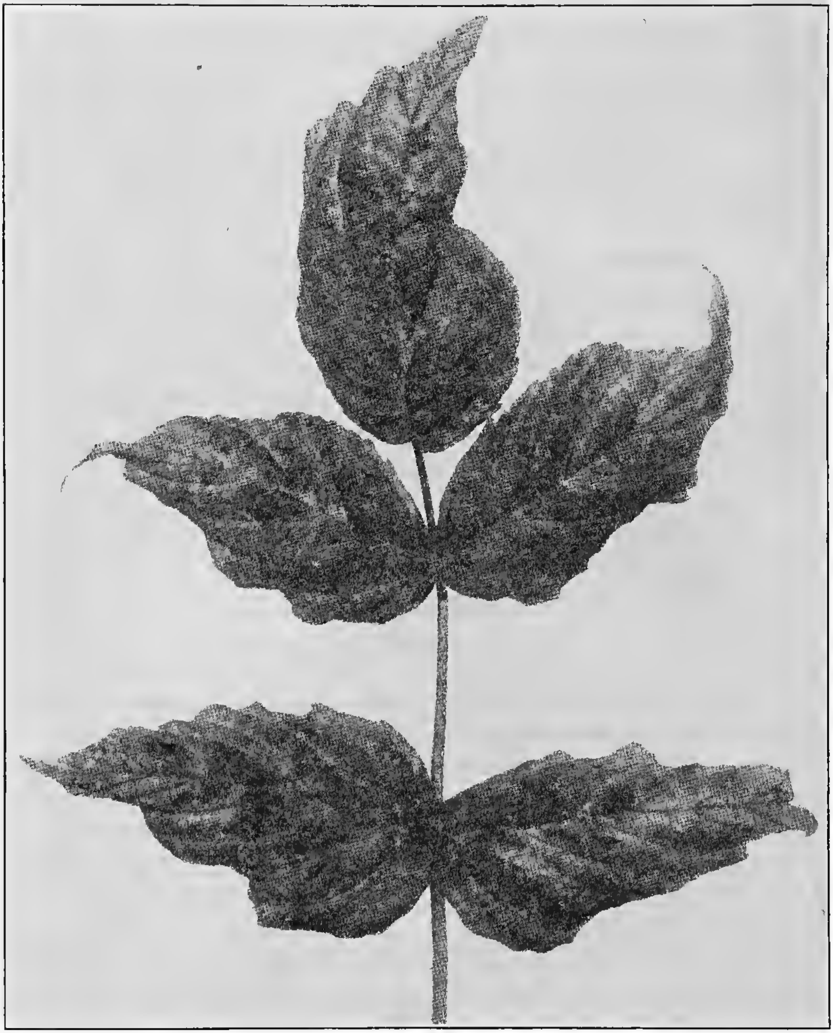
These laterals should be tipped back somewhat the following spring. The tipping should be in accordance with the vigor of the branches.

DISEASES

Mosaic and Leaf Curl

Raspberry mosaic is a virus disease transmitted by aphids or plant lice. The symptoms of the disease are a spotting and mottling of the leaves and even a crinkled condition in severe cases. The mottling varies from small yellowish spots to raised green blisters surrounded by yellow areas. Besides its effect on the leaves, a stunting of the whole plant, and a dying of the cane tips are also characteristic of the disease.

Leaf curl is another virus disease of raspberries, and is spread in the same manner as mosaic. It is characterized by a distinct curling of the leaves. Its severity is dependent upon the type of raspberry it attacks. Nearly all varieties are susceptible to mosaic and leaf curl, but the diseases have much more effect upon some, than on others. The vigor of the Cuthbert or Herbert is reduced to a greater degree by these diseases than that of the Latham variety.



Mosaic of Red Raspberry

Note light and dark green areas, and curling of the leaves.

The only methods of control for virus diseases are the selection of clean nursery stock and roguing. The former method needs no further explanation.

The young plantation should be rogued several times during the first season. The diseased plants should be burned or removed to a place where the aphids cannot return to the clean plants. Efficient roguing the first season may save the entire plantation from a severe infestation the following year. Each year after the first, the plants should be rogued at least twice, and all diseased plants carefully removed without shaking the plant lice on to the healthy bushes.

Great detail has not been gone into concerning these diseases as there is not the available space for it in this publication, but a great amount of work is now being done on virus troubles of raspberries, and the literature can be purchased from various experimental stations.

Anthracnose

This disease is not nearly as serious on red raspberries as on the black ones, yet it affects them and deserves some mention here. The first symptoms are small reddish brown spots which begin to appear on the new canes before they are six inches high. As the cane increases in size, these spots increase until they may completely encircle the stem in places. In this later stage the spots are more or less round and have a white sunken center, surrounded by a red ring. Small yellow spots are seen on the leaves, which enlarge in diameter until ultimately they become a light colored spot, surrounded by a red ring. The leaf lesions are small and more elongated than those on the canes.

The disease affects the pedicels and fruit, causing the fruit to shrivel and perhaps drop off.

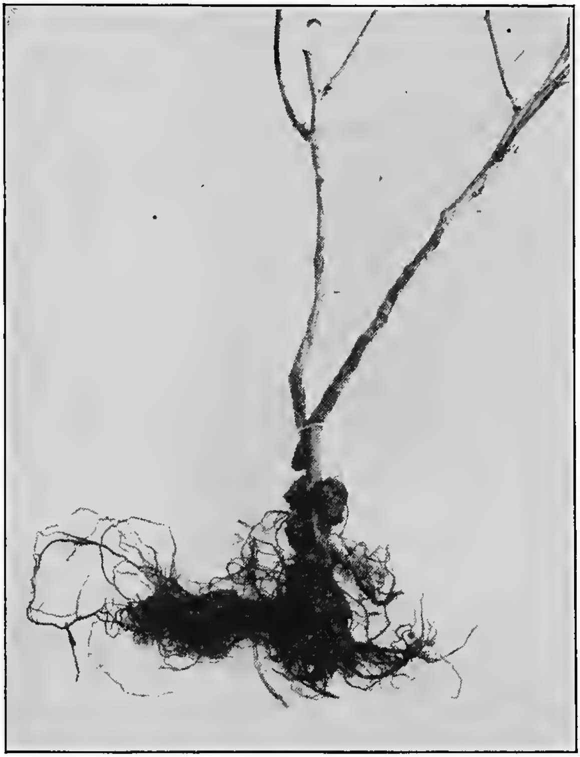
This disease can be controlled by sanitation practices and spraying, but on red raspberries it is usually not serious enough to demand much attention.

Taking out the old canes immediately after fruiting will help in preventing the spread of anthracnose. The grower should not allow his plants to grow so thickly as to inhibit the entrance of a generous amount of sunlight, as damp moist conditions are predisposing factors to this disease.

Crown Gall

Crown gall of raspberries is quite prevalent in Maine. It is a bacterial disease causing the formation of large, abnormal growths on the roots and around the crowns of the plants. In a single season it may develop into galls from ½ to 1½ inches in diameter.

This disease inhibits the translocation of food materials as well as demands a certain amount of the plant's nourishment for its own existence.



This Specimen of Crown Gall was Found in a Raspberry Plantation at Pittsfield, Me.

The grower should be certain to get clean nursery stock. Another important factor is to keep the plants in a vigorous growing condition, so as to reduce the susceptibility of the plants to the disease.

The plant shown in the accompanying illustration is one which looked absolutely clean when set out, but by fall it had developed crown gall to a serious degree. The disease was probably present on the nursery stock but had not shown itself when planted.

Raspberry Wilt

Raspberry wilt is becoming quite prevalent in the eastern section of the country. The disease works slowly requiring from 1 to 3 years to kill the plant. During the first summer the leaves of the infected plants turn pale green. But as the weather grows cooler along the latter part of the season, the leaves usually resume their natural color again. During the second season the leaves roll, turn brown, and drop off. The cane tips stop growing and wilt. The canes also turn dark blue. This condition may not occur until the third season, depending upon the vigor of the plants. The main control measures are to keep the plants growing vigorously, and to be careful what crops you allow them to follow. Raspberries should never follow potatoes or tomatoes that have been affected with wilt. Neither should they be planted in a plot of ground where raspberries have been previously grown within 3 or 4 years, as the disease lives over in the organic matter of the soil.

Spur Blight

Spur Blight is a disease which only recently has come prominently to our attention here in the State of Maine.

On the young canes this disease is characterized by purplish brown, slightly sunken areas, varying in size from ½ inch to 2 inches in area in its late stages. On the fruiting canes it is characterized by grayish areas filled with tiny blackish spots.

Control methods as advocated by various experimental stations seem to vary, but it seems safe to say that removing and burning the old canes as soon as they are through fruiting, is a help in controlling this disease. In an Illinois bulletin it is stated that in Colorado success has been obtained by the use of Bordeau mixture (3-4-50) to which 2 pounds of rosin-fish-oil soap has been added. Applications should be made to the young canes, special care being taken to cover the parts near the ground. The first spray should be applied when the plants are from 8 to 12 inches high. Subsequent sprays should be about two weeks apart, four sprays in all being applied.

No doubt, if the canes are not allowed to grow too thickly, this disease will not give very serious trouble in Maine under ordinary weather conditions.

INSECTS

Raspberry Cane Borer

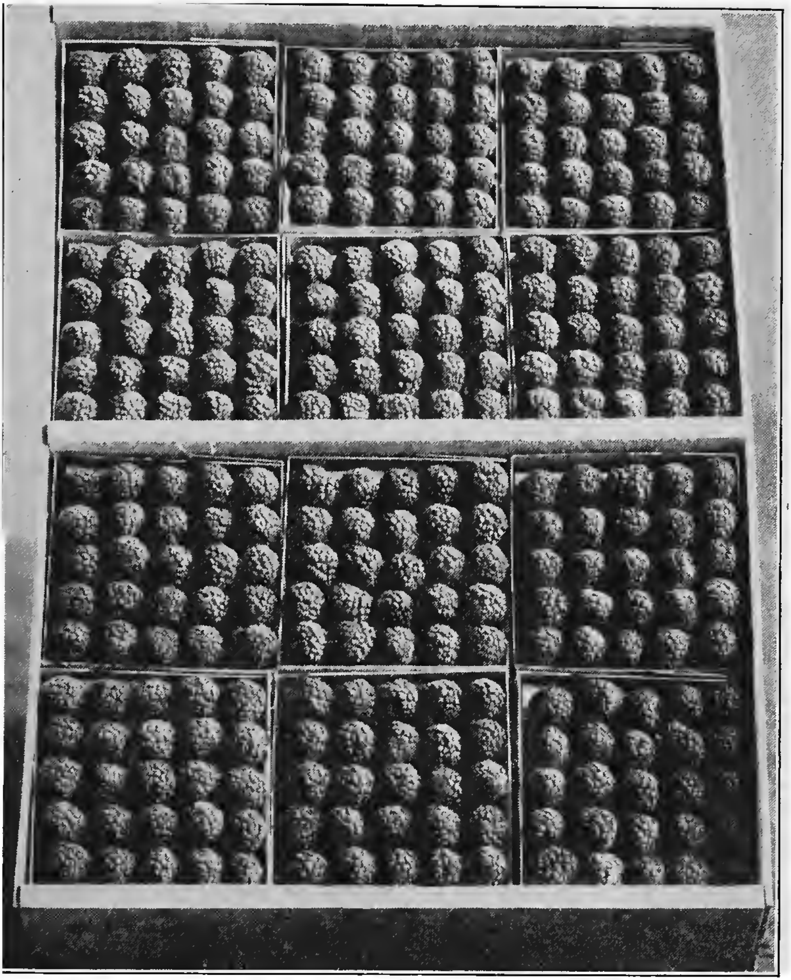
The adult of this insect is a long narrow black beetle with a yellow prothorax or neck. It lays its eggs in the tender shoots of the raspberry about 6 inches from the tip. It then girdles the stem above and below the egg puncture, which causes the tip of the cane to wilt. The eggs soon hatch out and the borer lives in the stem for two years before completing its life cycle.

The best control measures are to cut off the wilted tips and burn them, and to remove all old canes immediately after they have borne fruit.

The Raspberry Crown Borer

The adult stage of this insect is a clear-winged moth. It lays its eggs on the leaves during August and September. The young larvae hatch out and crawl down the stem to the base of the plant where they spend the first winter. The following spring, they burrow into the stem and live within the roots or in the stem near the crown of the plant during the entire season. They spend the second winter within the plant and feed there until midsummer the following season and then enter the pupal stage in July, and emerge as moths in August or September and lay their eggs again.

The insect is noticed by a sickly appearance of the plant, eventually resulting in death. The larvae can be dug out, or the entire plant can be removed. One or the other of the practices should be carried out.



A Display of Latham Raspberries

Note how well the berry holds its shape.

HARVESTING THE FRUIT

Raspberries are very perishable and should be picked at the proper time and marketed as quickly as possible. When the berries assume a dull red color, and separate readily from the receptacle, they are ready for picking.

As soon as the harvesting is begun, the plantation should be gone over every other day. In the warmest weather it is usually best to pick the fruit every day. The fruit should be picked thoroughly so that the berries will be uniform as to ripeness. The berries should not be picked in damp weather, as they will not stand up under shipping if in a wet condition.

The fruit should always be placed in a shady spot as soon as picked. Berries allowed to remain in the direct sunlight for only a short while, will deteriorate very rapidly.

A crew of good, steady, reliable pickers is very essential on a raspberry plantation of any size. The producer often profits by paying his pickers a little more if they will stay throughout the season and will return the following year.

MARKETING

The first essential in proper marketing is to have a product of high quality. Raspberries vary a great deal as to quality, depending largely upon the conditions under which the fruit is handled. If a grower has learned to handle his fruit in such a way as to place his berries on the market in good condition, he has completed the first step in marketing.

The next thing is to label his fruit in such a way that the consumer will recognize it a second time, and express a desire to purchase the same berries again.

Some sort of an attractive label on the crate, giving the name of the grower, will often aid a great deal in establishing a substantial business. Of course, it is needless to say that new crates and boxes should be used in order to make the fruit more attractive.

The fruit should be uniform throughout. It is a poor policy to place the boxes of high quality fruit on the top layer, placing the inferior berries at the bottom.

Often, if a grower lives within a few miles of a small city or even a town, he can build up a trade that will carry over from year to year. If he can leave his crates of berries at the stores, with his label attached to them, he will soon find that the buying public will be asking for his fruit.

Some growers here in the State of Maine are meeting with great success by sending their raspberries to Boston Commission Merchants. One large grower netted 19 cents per pint on his crop by marketing them in this manner. The same reputation for good berries can be established with a commission merchant, as with the small store keeper, or the buying public.

However, the exact method of marketing is not the essential point. If the grower will put out a high grade berry, and put it out consistently so that the public can depend upon a certain standard in his fruit, and if he will label his product so that the buyer will recognize it, there is no question as to the ready sale of his raspberries at an attractive price.